MONTANA CLINICAL COMMUNICATION AND SURVEILLANCE REPORT

Issue: January - March 2009

MONTANA
CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS

Montana Department of Public Health and Human Services
Chronic Disease Prevention and Health Promotion Program
Room C314, Cogswell Building - PO Box 202951
Helena, Montana 59620-2951

CHALLENGES IN PROVIDING CARE FOR ACUTE CORONARY SYNDROME IN RURAL MONTANA AND NORTHERN WYOMING, 2009.

WHAT'S INSIDE

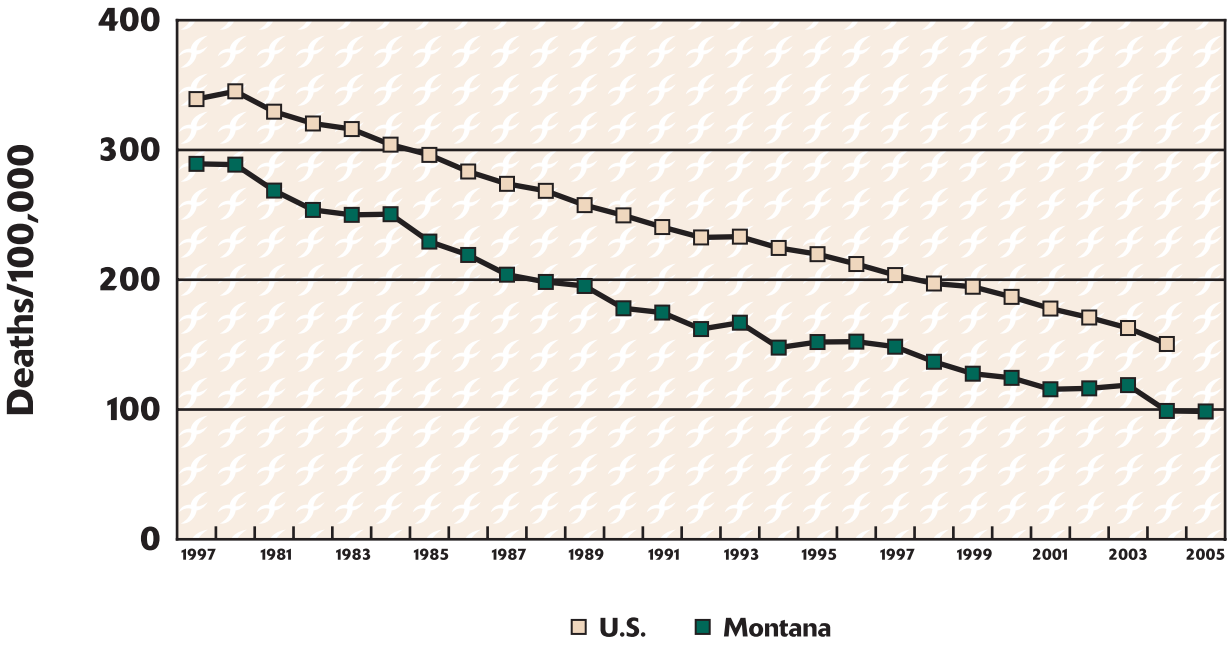
BACKGROUND

Coronary heart disease (CHD) is the second leading cause of death in Montana and accounts for approximately one in every five deaths.[1] There has been a steady decrease in CHD mortality both nationally (50% decrease) and in Montana (66% decrease) over the past three decades (Figure 1). However, the mortality rate for CHD for residents of rural counties remains higher than those residing in urban counties (Figure 2). Time is a crucial element in evaluating and treating patients with suspected heart attack. The development and implementation of time-saving protocols geared toward the rapid triage of patients may have a positive impact on outcomes. Updated guidelines continue to emerge from the American College of Cardiology and the American Heart Association reflecting research about optimal treatment and timing for acute coronary syndromes.[2,3] Ongoing efforts to improve therapies for acute coronary events and to decrease cardiovascular risk factors have been associated with reductions in coronary heart disease mortality in the United States.[4] Much of the focus in recent years has been centered on coordinating the systems of care to assure timely evaluation and treatment particularly for

ST-segment elevation myocardial infarction (STEMI).[2] Time to treatment is crucial no matter what the choice of reperfusion method, pharmacologic or catheter-based.[5,6] Emergency departments (ED) play a critical role in the evaluation and prompt selection of therapy for acute coronary syndromes.[7] Authorities suggest that the largest gains to be made in decreasing mortality from AMI, particularly for STEMI, are likely to come from developing the systems to apply the evidence already available.[8]

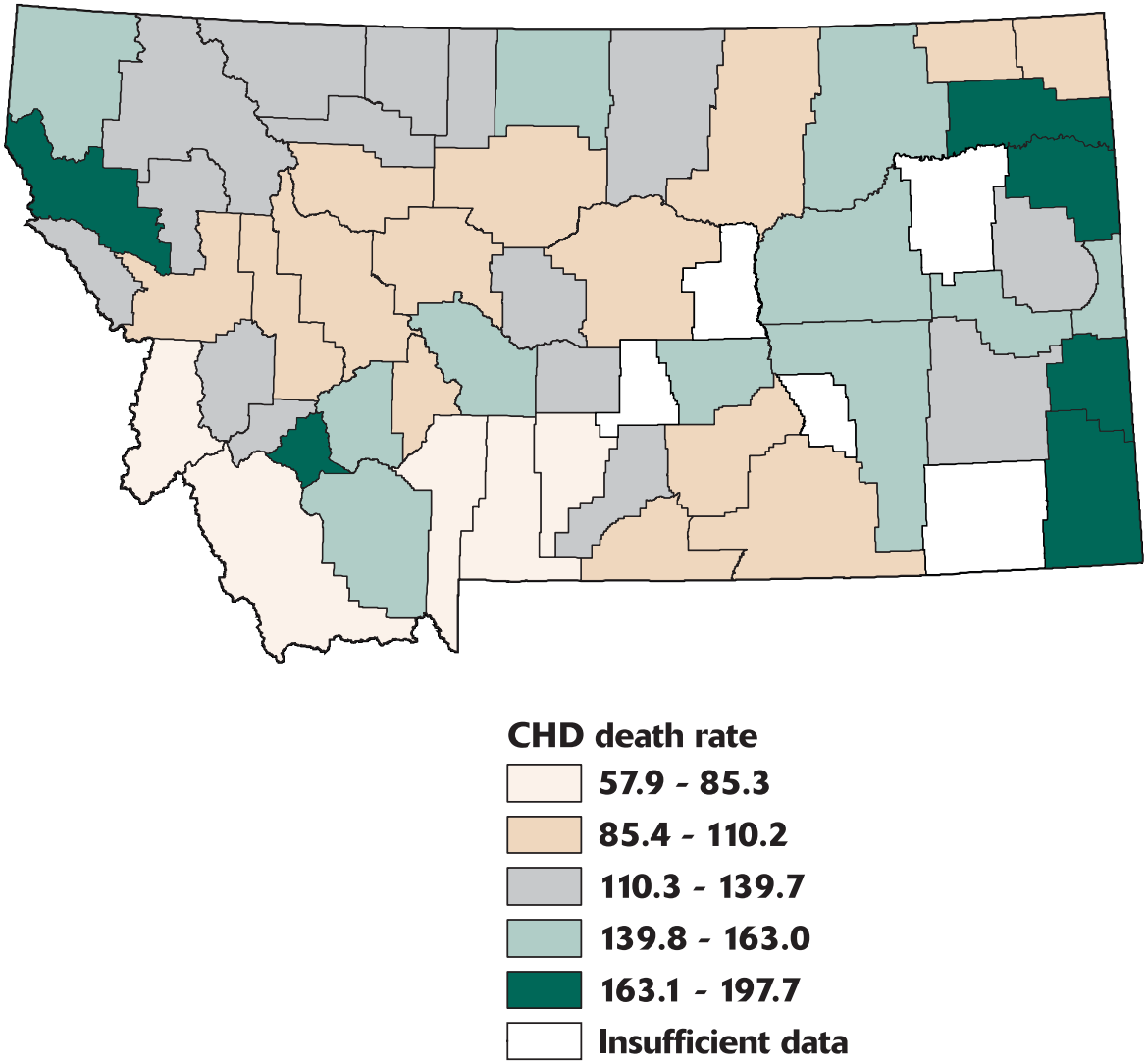
In 2008, the Montana Cardiovascular Health (CVH) Program surveyed non-interventional hospitals in Montana and northern Wyoming to assess the systems of care for patients presenting with acute myocardial infarction with an emphasis on STEMI. The survey included questions about pre-hospital care, ED procedures and details of their usual treatment and referral processes in relation to cardiac interventional facilities. Hospitals were also asked to indicate their overall assessment of care for acute coronary syndromes and their interest in reviewing and updating their protocols for acute myocardial infarction. This surveillance report summarizes the findings from the survey.

Figure 1. Age-adjusted coronary heart disease mortality rates for Montana and the general US population, 1979-2005.



MT (1979-1989) and US (1979-2003) data source: Compressed Mortality File, CDC Wonder (accessed: 11/27/06). Coronary heart disease mortality rate for US not available for 2005. MT (1990-2005) data source: Montana DPHHS, Vital Statistics.

Figure 2. Age-adjusted coronary heart disease death rates, by county, Montana, 1999-2005.



METHODS

The Montana CVH Program obtained a list of hospitals in Montana from the Montana Hospital Association website and a list of hospitals in northern Wyoming from the Wyoming Heart Disease and Stroke Prevention Program Manager. Northern Wyoming hospitals were included because cardiac patients from these facilities are often referred to interventional hospitals in south-central Montana. A cardiac interventional hospital was defined as a hospital that provides invasive cardiac procedures (e.g. percutaneous intervention and/or coronary artery bypass grafting). The nine cardiac interventional facilities in this region are all located in Montana and were excluded from this survey.

The Montana CVH Program developed the survey tool with input from the Montana Chapter of the American College of Cardiology, and questions were adapted from the American Heart Association STEMI survey. The cardiac care survey was administered to 61 non-interventional hospitals in Montana and northern Wyoming (50 in Montana and 11 in northern Wyoming). The survey consisted of 43 primary questions about hospital demographics, pre-hospital cardiac care, emergency department protocols and procedures, STEMI capacity, referrals to cardiac interventional facilities and overall assessment of cardiac care, as well as identifying hospital needs and opportunities to improve cardiac care.

Table 1. Hospital demographic characteristics and availability of laboratory services for cardiac enzyme testing in non-interventional hospitals, Montana and northern Wyoming, 2009.

	Total N = 41
	Mean (SD)
Number in-patient beds	19.9 (8.9)
Number of patients seen in ED	3603 (3997)
	% (n)
Critical access hospital	95 (39)
Laboratory services available 24/7	100 (41)
Performs cardiac enzyme testing	100 (41)
Troponin	100 (41)
Total CK	90 (37)
Total CK-MB	88 (36)
Cardiac enzyme tests available 24/7	100 (41)

Table 2. Pre-hospital care for patients with chest pain or rule out myocardial infarction, Montana and northern Wyoming, 2009.

	Total N = 41
	% (n)
EMS staff always notifies ED in route	88 (36)
Capacity to perform 12-lead ECG*	20 (8)
EMS personnel read ECG and interpretation called by phone or radio	63 (5)
ECG transmitted to hospital	12 (1)
Unable to transmit ECG	68 (28)
Geographic "dead spots"	25 (7)
Technological resources	32 (9)
Limited by type of EMS service	11 (3)
Pre-hospital thrombolysis used in community	7 (3)

*2 sites unable to transmit

The survey was mailed to the ED Directors at each non-interventional facility. To increase the response rate, telephone reminder calls were placed to ED Directors who did not return the questionnaire two and four weeks after the initial mail-out. Data analyses were completed using SPSS V14.0 software (SPSS Inc., Chicago, IL).

RESULTS

Forty-one (67%) of the 61 non-interventional hospitals completed the survey. The majority of hospitals responding to the survey were critical access hospitals (CAH). Most had cardiac enzyme testing available 24 hours a day, 7 days a week (24/7) (Table 1). The responding facilities estimated that about half the patients with acute chest pain arrived by ambulance. Almost 90% of responding facilities reported that their Emergency Medical Services (EMS) staff always notified the ED in route about the possibility of a patient having a heart attack, but only eight facilities reported that EMS had the capability of performing a 12-lead ECG. There were many barriers to the routine transmission of pre-hospital ECG tracings to the local facility (Table 2).

Most facilities reported that their facility had an ED chest pain protocol, which included many important elements as shown in Table 3. A total of 28 facilities reported that there was a specific protocol for AMI used in the ED; however, only about half included procedures specifically for STEMI (Table 4).

Most facilities reported they had staff available 24/7 to recognize STEMI, and most had treated patients with thrombolytic agents in the ED during 2007. One-third of responding facilities reported making the decision to treat without waiting for a cardiac consultation, which took on average 11 minutes (range: 4–30 minutes) (Table 5).

Survey respondents were asked to rate different aspects of acute cardiac care in their community. Approximately one-quarter of the respondents rated pre-hospital as excellent. In contrast, over half the responding hospitals rated the ED, cardiac consultative services via telephone and transfer procedures as excellent (Table 6). Most facilities were interested in reviewing and updating protocols for AMI and STEMI, as well as training in recognition of STEMI. Twenty-nine hospitals responded they would be interested in working on particular components of STEMI care in Montana in cooperation with cardiac referral centers, using a regional or hub-and-spoke approach (data not shown).

DISCUSSION:

Despite the limitations of the self-reported data and the fact that not all hospitals responded, the findings from this survey of non-interventional hospitals outline important and challenging opportunities in rural Montana. Pre-hospital ECG and transmission of tracings in route are not uniformly available. Most facilities

Table 3. Elements and use of emergency department chest pain protocols by non-interventional hospitals, Montana and northern Wyoming, 2009.

	Total N = 41
	% (n)
ED chest pain protocol	95 (39)
Chest pain protocol always used	69 (27)
Element included in chest pain protocol include:	63 (5)
History of symptom onset	92 (36)
ECG within 10 minutes of ED arrival	95 (37)
MONA*	95 (37)
STEMI checklist and thrombolysis eligibility	77 (30)
Adjunctive Rx interventions	69 (27)
Troponin and other cardiac enzymes	97 (38)
Cardiac Risk Score	13 (5)

*MONA – Morphine, Oxygen, Nitroglycerin and Aspirin

Table 4. Elements and use of emergency department AMI protocols by non-interventional hospitals, Montana and northern Wyoming, 2009.

	Total N = 41
ED AMI protocol	68 (28)
AMI protocol always used	75 (21)
AMI protocol last updated in 2007 or 2008	79 (22)
AMI protocol includes procedures specific for STEMI	50 (14)
Assessment for thrombolytics	100 (14)
Contraindications for ECG within 10 minutes of ED arrival	43 (6)
Thrombolytic agent – Alteplase	29 (4)
Thrombolytic agent – Reteplase	29 (4)
Thrombolytic agent – Tenecteplase	43 (6)
Other thrombolytic agent*	21 (3)
Observation and transfer to cardiac interventional facility	57 (8)

*TNKase

have 24/7 cardiac enzymes and diagnostic ECG available, along with ED protocols for acute coronary syndromes. Many have protocols specific to STEMI and have treated individuals with fibrinolytics. However, important time-saving opportunities to coordinate cardiac care, consultation and transfer to interventional facilities remain.

On February 24, 2009, the Montana Cardiovascular Health Program convened a Cardiac Workgroup meeting which reviewed previous quality management efforts from 2004-2006 and considered the findings from the current survey. Attendees included representatives from the Montana Chapter of the American College of Cardiology, Montana Cardiovascular Health Program, Montana Association of Cardiovascular and Pulmonary Rehabilitation, the Mountain - Pacific Quality Health Foundation and critical access hospitals.

The workgroup identified systems that are currently in place and opportunities to improve timely and coordinated systems of care across different regions of the state. Although the survey emphasized STEMI because of urgency of reperfusion and the specificity of current guidelines, participants recommended that efforts to coordinate between rural facilities

Table 5. Recognition of STEMI and use of thrombolytic therapy, Montana and northern Wyoming, 2009.

	Total N = 41
	% (n)
Staff available 24/7 who can recognize STEMI on ECG	90 (37)
Make decision to treat eligible STEMI patient with thrombolytics before discussing with cardiologist	32 (13)
Frequently wait to confirm treatment with cardiologist	31 (4)
	Mean (range)
Time it takes to reach and speak with a cardiologist	11.2 (4 - 30)
In 2007, number times STEMI patients treated with thrombolytics in ED	3.6 (0 - 15)
Critical access hospital (CAH)	3.4 (0 - 15)
Non-CAH	6.5 (3 - 15)

Table 6. Rating of acute cardiac care in community, Montana and northern Wyoming, 2009.

	Excellent	Good	Poor
	% (n)	% (n)	% (n)
Pre-hospital	27 (11)	61 (25)	12 (5)
Emergency Department	61 (25)	39 (16)	
Cardiac consultation via phone	51 (21)	46 (19)	2 (1)
Transfer to cardiac referral hospital	51 (21)	49 (20)	

and interventional cardiac centers be directed to both STEMI and non-STEMI. In the coming months, with the cooperation of members of the Montana Chapter of the American College of Cardiology and the American Heart Association, efforts will be directed to clarify referral procedures for cardiac interventional programs and to review and update existing protocols in rural hospitals based on a comprehensive template.[9] Customizing community-specific protocols across the systems of care will require careful consideration of both pre-hospital and transfer capabilities within the community, cardiac referral facilities and resources for cardiac rehabilitation at local facilities. The workgroup felt the efforts should include professional education for health care teams and a coordinated communication system between facilities at the time of transfer from rural hospitals and at the time of discharge from interventional facilities.

For additional information about Cardiac Workgroup activities, please contact Mike McNamara at (406) 444-9170 or e-mail mmcnamara@mt.gov.

ACKNOWLEDGEMENTS

The Montana Cardiovascular Health Program gratefully acknowledges the contributions of the American Heart Association and the Montana Chapter of the American College of Cardiology for their work and assistance in developing and reviewing the survey tool.

REFERENCES

[1] The Burden of Heart Disease and Stroke in the Big Sky State, Montana 2007. View entire report at *http://www.dphhs.mt.gov/PHSD/cardiovascular/pdf/146192LR_000.pdf*.

[2] American College of Cardiology/American Heart Association, 2007 focused update of the ACC/AHA 2004 guidelines for the management of patients with ST-elevation myocardial infarction. Circulation 2008; 117:1-34.

[3] Anderson JL, Adams CD, Antman EM, et. al. ACC/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction) Developed in collaboration with the American College of Emergency Physicians, the Society for Cardiovascular Angiography and Interventions, and the Society of Thoracic Surgeons endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation and the Society for Academic Emergency Medicine. *J Am Coll Cardiol* Aug. 14, 2007; 50(7):e1-e157.

[4] United States Department of Public Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, Compressed Mortality File compiled from CMF 1968-1988, Series 20, No. 2A 2000, CMF 1989-1998, Series 20, No. 2E 2003 and CMF 1999-2003, Series 20, No. 2H 2004 on CDC WONDER On-Line Databases.

[5] Nallamothu BK, Bradley EH, Krumholz HM. Time to treatment in primary percutaneous coronary intervention. *New Engl J Med* 2007; 357:1631-8.

[6] Boden WE, Eagle K,Granger CB. Reperfusion strategies in acute ST-segment elevation myocardial infarction: a comprehensive review of contemporary management options. *J Am Coll Cardiol* 2007; 50:917-29.

[7] Peacock WF, Hollander JE, Smalling RW, Bresler MJ. Reperfusion strategies in the emergency treatment of ST-segment elevation myocardial infarction. *Am J Emerg Med* Mar. 2007; 25(3):353-66.

[8] White HD. Systems of care: need for hub-and-spoke systems for both primary and systematic percutaneous coronary intervention after fibrinolysis. Circulation 2008; 118:219-222.

[9] Jollis JG, Roettig ML, Aluko AO, Anstrom KJ, Applegate RJ, Babb JD, Berger PB, Bohle DJ, Fletcher SM, Garvey JL, Hathaway WR, Hoekstra JW, Kelly RV, Maddox WT Jr, Shiber JR, Valeri FS, Watling BA, Wilson BH, Granger CB. Reperfusion of Acute Myocardial Infarction in North Carolina Emergency Departments (RACE) Investigators. Implementation of a Statewide System for Coronary Reperfusion for ST-Segment Elevation Myocardial Infarction. *JAMA* 2007; 298:2371-80.

SAVE THE DATE

WYOMING DIABETES AND CARDIOVASCULAR DISEASE 2009 CONFERENCE – "PUTTING IT ALL TOGETHER" MAY 7-8, 2009

Ramada Riverside Plaza - Casper, Wyoming

The Wyoming Diabetes Prevention and Control and Heart Disease and Stroke Prevention Program's annual conference will be held on Thursday, May 7th and Friday, May 8th, 2009 in Casper, Wyoming at the Ramada Riverside Plaza. For more information, contact Betty Holmes at betty.holmes@health.wyo.gov. To register for the conference, go to *https://oscse.uwyo.edu/eventmanager/OnlineRegistration.asp?EventCode=770.*

MONTANA DIABETES ANNUAL PROFESSIONAL CONFERENCE – "DIABETES CARE IN MONTANA 2009: BACK TO BASICS" OCTOBER 8-9, 2009

Crowne Plaza Hotel - Billings, Montana

The Montana Diabetes Project's annual professional conference will be held on Thursday, October 8th and Friday, October 9th, 2009 in Billings, Montana at the Crowne Plaza Hotel. For additional information, contact Susan Day at (406) 444-6677 or e-mail sday@mt.gov.

WHAT ARE THE MONTANA DIABETES PREVENTION AND CARDIOVASCULAR HEALTH PROGRAMS AND HOW CAN WE BE CONTACTED?

The Montana Diabetes Control and Cardiovascular Health Programs are funded through cooperative agreements with the Centers for Disease Control and Prevention, Division of Diabetes Translation (U32/CCU822743-05), the Division for Heart Disease and Stroke Prevention (5U50 DP000736-02) and through the Montana Department of Public Health and Human Services.

The mission of the Diabetes Control and Cardiovascular Health Programs is to reduce the burden of diabetes and cardiovascular disease among Montanans. Our web pages can be accessed at http://www.diabetes.mt.gov and http://montanacardiovascular.state.mt.us.

For further information please contact us at:

Section Manager
Mark Niebylski, PHD, MBA, MS
mniebylski@mt.gov

CVH Program Manager
Crystelle Fogle, MS, MBA, RD
cfogle@mt.gov

Diabetes Education Coordinator
Marci Butcher, RD, CDE
marcibutcher@msn.com

Epidemiologist - Diabetes
Taryn Hall, MPH
thall@mt.gov

Epidemiologist - CVH
Carrie Oser, MPH
coser@mt.gov

CVH Quality Improvement Coordinator
Marilyn McLaury, MS, RD
mmclaury@mt.gov

Quality Improvement Coordinator
Diabetes Program
Chris Jacoby, BSN, RN
cjacoby@mt.gov

Quality Improvement Coordinator
Diabetes Program
Elisabeth Mann, RN, CDE, CPT
elsmann2@yahoo.com

Health Education Specialist
Linda Krantz
lkrantz@mt.gov

OR YOU MAY CALL:

Quality Improvement Coordinator
Cardiovascular Disease and
Diabetes Prevention Program
Karl Vanderwood, BS
kvanderwood@mt.gov

CVH Secondary Prevention Specialist
Michael McNamara, MS
mmcnamara@mt.gov

Office Manager/Accountant
Susan Day
Phone: 406-444-6677
sday@mt.gov

Administrative Assistant
Ava Griffenberg
Phone: 406-444-5508
agriffenberg@mt.gov

MONTANA CLINICAL COMMUNICATION & SURVEILLANCE REPORT

MONTANA
CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS
69720

Montana Department of Public Health and Human Services
Chronic Disease Prevention and Health Promotion Program
Room C314, Cogswell Building
PO Box 202951
Helena, Montana 59620-2951

14016-0309